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ABSTRACT

Reading achievement of students in second to sixth grade in three school districts participating in a performance-contracting program was tested, using the Stanford Achievement Test and the Metropolitan Achievement Test, at the beginning and the end of the school year. The performance contract for each of the districts included a parental-involvement component. Analysis of results indicated that students in the programs achieved at a significantly higher rate than was expected on the basis of national norms. There were also differences in the reading achievement scores of the three districts. For those districts where parental involvement was pro forma and consisted of either filling out a questionnaire or attending large group meetings, the achievement of the pupils was similar but was less than the achievement in the district where parents participated in deciding what was taught and had responsibility for working with the teachers and children. (AA)

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THE EFFECTS OF PARENTAL INVOLVEMENT ON STUDENT ACHIEVEMENT IN THREE MICHIGAN PERFORMANCE CONTRACTING PROGRAMS

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Introduction

The Michigan Legislature authorized funds under Chapter 4, Section 41, of the State Aid Act of 1972, for performance contracts at the local school level. Nine participating districts utilized these funds during the 1973-74 school year for the development of inservice education projects to improve teachers' instructional and classroom management skills, and to utilize unique delivery systems in the instructional process at the classroom level. Three of the participating school districts were included in this study because a parent involvement component was written into each contract.

Purpose of the Study

The main purposes of the study were: (1) to determine if students who participated in the selected performance contracting programs achieved in reading at a significantly higher rate than could have been expected had they remained in the regular school reading programs as defined by the norming population, (2) to determine if there was a significant difference in reading achievement among the performance contracting programs included in the study, and (3) to compare similarities and differences of the contracts and to determine the features; i.e., parental involvement, of the performance contracts that may have accounted for the difference in reading achievement.

The methodology used by Wrightstone, Hogan, and Abbott (1970) and expanded by Schooley (1974) was selected to provide information about the effects of performance contracting. The researchers stated that if a child is pre-tested on a nationally-standardized test, it is possible to predict the child's post-test score at the end of the regular school year by examining beginning and end-of-the-year norm tables.

According to the method used by Wrightstone, Hogan, and Abbott, a child's grade equivalent unit (G.E.U.) score on a pre-test in reading is used as the starting point for calculating an expected post-test G.E.U. The percentile rank of the pre-test G.E.U. is determined from the norm tables provided with the nationally-standardized tests. The norm tables are constructed in such a manner that it can be assumed that a child showing normal growth in a regular school program will score at approximately the same percentile rank at post-test time as the child originally scored on the pre-test. Thus, once the child's pre-test percentile rank has been determined, it is possible to determine the expected post-test G.E.U. by going to the end-of-the-year norm table, finding the pre-test percentile rank in this table, and observing the corresponding G.E.U.

This study made a comparison of actual post-test scores obtained on nationally-normed tests (Stanford Achievement Test, Metropolitan Achievement Test) with the expected post-test scores. These comparisons were made at grades two through six. Average district results by grade level were derived from a total of 1779 individual pupil records.

The study used reading scores of second through sixth grade students who participated in the performance contracting programs from three selected school districts. For the purposes of this study, the three school districts were identified as District A, District B, and District C.

In District A, 904 students in three schools received instruction under the performance contracting program. The students were pre- and post-tested. A parent involvement component was included in the contract. In District B, 273 students in one school received such instruction. A parent involvement component was written into the contract, and the students were also pre- and post-tested. District C had 602 students from eight schools receiving instruction under the performance contracting program. A parent component was written into the contract, and students were similarly pre- and post-tested.

Reading Achievement

Reading achievement data of pupils in the study were analyzed in the following manner:

(1) A total reading score for each pupil was derived.

(2) The mean pre- and post-test grade equivalent units were calculated for each grade (2-6) in each school district.

(3) The percentile rank of the pre-test grade equivalent units were then determined from the appropriate norm tables provided with the Metropolitan Achievement Test or the Stanford Achievement Test.

(4) The pre-test percentile ranks were then located in the end-of-the-year norm table and the expected post-test grade equivalent units were determined.

(5) The mean expected post-test scores were compared with the mean obtained post-test score. It should be noted that this method of comparing the expected versus obtained scores controls for the difference in starting points (pre-test) for each district. It takes advantage of the fact that expected scores are the best estimates of the population parameters; i.e., given these pre-test

scores, a nationally representative group would achieve the expected scores on the post-test.

(6) Since the expected post-test scores are assumed to be the population parameters, it was decided to use a Z test to determine if the obtained post-test scores were statistically different from the expected post-test.

(7) The number of students, means, and standard deviations were computed for the obtained post-test scores at each grade level with each district.

(8) The standard errors of the means were calculated at each grade level.

(9) Using the data obtained in steps (7) and (8), Z's were computed and statistically significant differences, if any, were noted. An alpha level of .05 was selected in order to ensure practical as well as statistical significance.

(10) A one-way analysis of variance was computed to provide additional information regarding whether there was a significant difference among the three districts based on their gain scores in reading achievement.

(11) The performance contracts were examined to indicate what factors may have contributed to the success of the districts' programs.

Program Descriptions

The purpose of this section is to briefly describe the programs in each district.

District A

District A's program was a guaranteed performance contract with Behavioral Research Laboratories (BRL). Behavioral Research Laboratories

guaranteed a pupil reading achievement growth rate at the national average--with much of the firm's payment contingent on the gains in pupil test scores. Behavioral Research consultants provided inservice education for teachers and administrators in planning and implementing the reading program.

Behavioral Research Laboratory's reading program was highly individualized with specific objectives at each level. The most pronounced feature of this individualized program was the use of programmed instruction to channel students toward the objective and to immediately correct and reinforce the right answer.

Students received their placement tests in October and two days later, began their work in BRL materials. Performance guarantee for participating pupils in grades two through six was $50 per student for a .7 gain and $37.50 per student for a .5 to .69 gain. Grade gains were determined on a pre- and post-test design using the Stanford Achievement Test. One hundred twenty days attendance was required, and $50 was paid BRL for each student participant in attendance for a shorter period of time.

District B

District B signed a performance contract with Intermarc, Inc., aimed at providing a guaranteed student growth level in reading of one month of tested grade equivalent for every month in the program.

Intermarc, Inc., utilized the Hoffman reading materials--a total reading system with high interest reading materials and audio-visual presentations. The system required individual and small group instruction which demanded constant attention from the teachers and aides. Instruction took place in a Learning Center which housed the Hoffman equipment.

Small groups of children were seated at tables to receive reading instruction via audio-visual machines that presented the reading material appropriate to the group's reading ability. Participants visited the

centers for their reading periods for approximately 50 minutes per day, five days per week. The Hoffman system was intended to be the core or basal instructional thrust upon which other learning activities were correlated.

The Stanford Achievement Test was used to determine gains in grades one through six with an incentive amount of $25 per student available for gains of .8 or more. Incentive payments were also available for students who achieved the .8 gain and had valid pre- and post-tests but were not in attendance the required number of days.

District C

District C established a demonstration project involving parents, teachers, administrators and Ross Learning, Inc. The school district established the Community School Effectiveness Program (C-SEP) as a means of improving the reading skills of elementary age students.

Ross Learning, Inc., participated as the outside performance contractor in C-SEP, and provided inservice training to school administrators, teachers, and parents. The Community School Effectiveness Program provided intensive inservice training for 40 parents who served as parent leaders. The parent leaders conducted inservice sessions for other parents who had children involved in the performance contracting program. Parent inservice sessions were geared to the following areas: (1) understanding the child's educational program; (2) parents and schools working together to assist children in achieving reading objectives; and, (3) parents being able to assist and reinforce the child's learning in the home. Intensive inservice education was also provided for teachers designed to improve their management of an individualized reading program.

Six hundred students in grades two through six were evaluated by the Metropolitan Achievement Test with a maximum incentive payment of $63 and a minimum payment of $15 (divided equally between parents, participating schools and Ross Learning) based upon grade equivalent units. Payments to parents were in the form of vouchers redeemable for purchase of educational materials. Payments to the participating elementary schools were used to purchase additional educational materials and equipment for use in their classroom. A prorated amount was paid Ross Learning for participants who dropped out during the school year.

Three hypotheses were developed to (1) test for differences between obtained and expected post-test scores, (2) test for differences in reading achievement among the performance contracting programs, and (3) determine what features of the contracts may have caused the differences in reading achievement among the programs.

Significant differences were found in the hypotheses measured. After an analysis of the data, it was apparent that students in the performance contracting programs achieved at a significantly higher rate in reading than was expected. Significant differences were also found in the reading achievement scores between District C and District A, and District C and District B. Analysis of similarities and differences among the contracting programs revealed a major difference existing between District C and District A, and District C and District B. This major difference may have caused the differences in reading achievement between District C and Districts A and B.

Results

In the first part of the study, the differences in reading achievement scores for students in performance contracting programs were compared to reading achievement scores had the students remained in regular school

reading programs. Each student who participated in the performance contracting programs was pre- and post-tested. Students in Districts A and B were pre- and post-tested with the Stanford Achievement Test. Students in District C were pre- and post-tested with the Metropolitan Achievement Test. In determining if there was a difference between obtained reading scores and expected reading scores, pre- and post-tested scores were examined. Actual pre-test scores were used as the basis for calculating expected end-of-the-year post-test scores. The expected post-test scores were then compared with the obtained post-test scores using a Z test.

Table 4.1 presents the difference between expected reading achievement scores and obtained scores for each grade in District A. The findings indicate that students in the performance contracting programs in grades two, four, five and six achieved at a higher rate in reading than could have been expected had they remained in the regular school reading program. The findings also indicate that students in grade four achieved at a higher rate than did students in grades two, five, and six. Students in grade three actually scored lower than expected.

Table 4.1

COMPARISION OF OBTAINED POST-TEST SCORES WITH EXPECTED POST-TEST SCORES ON THE STANFORD ACHIEVEMENT TEST FOR GRADES 2-6 READING

DISTRICT A

Grade	Pre-Test $\bar{x}$ GEU	Expected Post-Test $\bar{x}$ GEU	Obtained Post-Test $\bar{x}$ GEU	Difference
2	1.4	1.7	2.1	+ .4
3	2.1	2.6	2.5	- .1
4	2.5	3.0	3.6	+ .6
5	3.3	3.7	4.1	+ .4
6	4.1	4.6	4.7	+ .1

Table 4.2 presents the difference between expected reading achievement scores with the obtained reading scores for each grade in District B. The findings indicate that students in the performance contracting programs in grades two, three, and five achieved at a higher rate in reading than could have been expected had they remained in the regular school reading program. Students in grade five in this district achieved at a higher rate than did students in grades two, three, four and six. Students in grade four actually scored lower than expected and in grade six they scored exactly as expected.

Table 4.2

COMPARISON OF OBTAINED POST-TEST SCORES WITH EXPECTED POST-TEST SCORES ON THE STANFORD ACHIEVEMENT TEST FOR GRADES 2-6 READING

DISTRICT B

Grade	Pre-Test $\bar{x}$ GEU	Expected Post-Test $\bar{x}$ GEU	Obtained Post-Test $\bar{x}$ GEU	Difference
2	1.7	2.2	2.4	+ .2
3	2.6	3.2	3.5	+ .3
4	3.0	3.7	3.4	- .4
5	3.8	4.2	4.6	+ .4
6	4.3	5.0	5.0	.0

Table 4.3 presents the difference between expected reading achievement scores with the obtained reading scores for each grade in District C. The findings indicate that students in the performance contracting programs in grades two through six achieved at a higher rate in reading than could have been expected had they remained in the regular school reading program.

Students in grades two, three and four achieved at a higher rate in District C than students in grades five and six.

Table 4.3

COMPARISON OF OBTAINED POST-TEST SCORES WITH EXPECTED POST-TEST SCORES ON THE METROPOLITAN ACHIEVEMENT TEST FOR GRADES 2-6 READING

DISTRICT C

Grade	Pre-Test $\bar{x}$ GEU	Expected Post-Test $\bar{x}$ GEU	Obtained Post-Test $\bar{x}$ GEU	Difference
2	2.0	2.5	2.9	+ .4
3	2.5	2.8	3.3	+ .5
4	3.0	3.5	4.0	+ .5
5	4.0	4.6	5.0	+ .4
6	5.4	6.0	6.3	+ .3

The data presented in Tables 4.1, 4.2, and 4.3 show that students in the performance contracting programs in grades two through six for all school districts except grade three in District A and grades four and five in District B, achieved at a higher rate in reading than could have been expected had they remained in the regular school reading program.

In an attempt to determine if the differences between the expected scores and the obtained scores were statistically significant, Z scores were calculated at each grade level for each school district.

Table 4.4 presents the scores that were computed for each grade level to statistically determine if the obtained mean scores were different from the expected mean scores at each grade level. A perusal of Table 4.4 indicates that District A and District C each had three grade

levels in which the obtained scores were significantly different from the expected scores. In District B, no grade level obtained scores that were statistically different from the expected scores.

Table 4.4

Z SCORES FOR DISTRICTS A, B, AND C
FOR GRADES 2-6 READING

Grades	District A	District B	District C
2	8.16*	2.38	4.70*
3	- 1.47	2.58	3.85*
4	9.99*	- 3.15	3.62*
5	4.25*	2.55	2.45
6	0.86	0.00	1.22

* $< .001$

In the next part of the study, the differences in reading achievement among the performance contracting programs were tested. In attempting to determine if there was a significant difference in student reading achievement among the performance contracting programs, the mean gain in reading achievement was computed using the difference between the pre- and post-test scores for each grade in District A, B, and C. In order to gather information regarding the hypothesis, a one-way analysis of variance was conducted using the gain scores. Table 4.5 presents: (1) the mean gain in reading for each district; (2) variances of each district's gain scores; and (3) the number of students in the performance contracting programs for each district. An examination of Table 4.5 reveals that students in Districts A and B have mean gains in reading (i.e., .681 and .682,

respectively). The mean gain score in reading for students in District C (i.e., .944) however, differed substantially from Districts A and B.

Table 4.5

MEANS AND VARIANCES OF THREE SELECTED SCHOOL DISTRICTS FOR GRADES 2-6 READING

	District A	District B	District C
Means	.681	.682	.944
Variance	.704	.677	.905
N	904	273	602

A one-way analysis of variance was used to determine whether a significant difference existed among the three selected school districts. Table 4.6 reports that differences existed among the districts at the .001 level of significance. The analysis of variance did not reveal where the differences existed among the three districts, however, it appeard the significant differences were between District C and A, and District C and B.

Table 4.6

A ONE-WAY ANALYSIS OF VARIANCE, COMPARING THE EFFECTS OF PERFORMANCE CONTRACTS AMONG THREE SELECTED SCHOOL DISTRICTS FOR GRADES 2-6 READING

Source of Variation	SS	df	MS	F
Treatments (Between Groups)	27.36	2	13.68	22.34
Experimental Error (Within Groups)	1064.46	1776	.599	
TOTAL	1091.82	1778		

$p < .001$ =

The last part of the study sought to determine what variables in the performance contracts may have caused the differences in reading achievement. The question of what similarities and differences, if any, existing among the selected performance contracting programs was investigated with the following findings.

Common Characteristics

All students receiving reading instruction under the performance contracts were classified as educationally disadvantaged and one hundred percent (100%) of the allocated budgets were specifically used for those students.[1]

Each performance contracting program had planned goals, objectives, needs assessment procedures, planned delivery systems to achieve goals, and an outside evaluator.[2] The outside evaluators conducted an interim evaluation at each program (i.e., an on-site visit with formal observation checklist) at least four months after the programs were in operation.

The school districts planned to turnkey the performance contracting programs into their ongoing regular curriculum and enough flexibility was provided in each contract to allow districts to make minor adjustments during the term of the contract. No evidence was found, however, to indicate that any contract was changed during the course of the 1973-74 school year.

Consultant services were provided to each district by their respective contractors in the area of preservice and inservice education for

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[1]An educationally disadvantaged student was defined as a student whose achievement in reading was below that expected of students of similar age and grade.

[2]Delivery system was defined as the instructional program component demonstrating what the staff does to help students achieve stated goals and objectives.

teachers and other staff. Consultant services were provided throughout the duration of the contracting activities.

The performance contracting programs were similar in most aspects; however, there was one major difference among the programs, especially between District C and District A, and District C and District B. This difference may have accounted for the variation in student reading achievement among the school districts.

Major Difference Among the Selected Performance Contracting Programs

There was one major difference between District C and Districts A and B with regard to parent involvement/participation.

Through District A's parent involvement component a community information program was established to assure that parents and others in the community understood the district's performance contracting program and its implication for their children. Each participating school's principal was responsible for informing the community through informational community meetings. At least four such meetings were held during the school year.

District B's parent involvement component consisted mainly of an open house at the beginning of the school year. Also, demonstrations regarding the contracting program's educational delivery system were presented at a PTA meeting.

District C's performance contract stipulated that parents of participating students would receive inservice education on how they could assist their children in achieving project objectives. Inservice education sessions were designed so that parents and teachers could work together as a team. Contracts in Districts A and B did not contain a parent inservice education component. Further analysis of contracts in District C revealed that parents

and teachers shared profits earned as a result of pupil achievement. The profits earned in Districts A and B went solely to the contractor.

Each selected district had a primary goal, and the primary goal in District C was dramatically different from those stated by Districts A and B. The primary goal for Districts A and B focused primarily on the student; i.e., students will grow in reading development at a rate of one-tenth grade equivalent for every one month in the performance contracting program. The primary goal for District C was to provide inservice education to parents and teachers, emphasizing the development of basic skills for participating students. Parents and teachers were also provided with a more realistic understanding of the respective reinforcement role of parents and teachers in the learning process.

The contractor for District C utilized all significant data pertaining to student achievement levels. With this information the contractor developed individualized parental guidelines for improvement of their children in school. These parental descriptions included assorted materials to use in working with specific difficulties.

After testing and prescribing processes were completed, the contractor categorized parents with teacher assistance according to student achievement profiles. For instance, specific reading problems were separated from mathematics and levels of difficulty also separated.

The parents were then assigned with selected teachers to a schedule of meetings through the year. Parents were paid a "stipend" for attendance at these meetings and received a bonus payment equivalent to the achievement gains of their children. The bonus payments to parents were in the form of vouchers redeemable for purchase of educational materials.

Teachers were identified in participating buildings to attend parent effectiveness meetings. The teachers representing each building communicated the content of each topic and provided parent reactions to other building personnel.

Summary of the Major Differences Among the Performance Contracting Programs

The major distinction among the three performance contracting programs can best be summarized with the following concept. For those districts where parental involvement was "pro forma" and consisted either of filling out a questionnaire or attending large group meetings, the achievement of the pupils was similar but less than the achievement in the district where parents participated in deciding what was taught and had responsibility for working with the teachers and children.